A Petri Net-based Semantic Validity Model for Services Composition

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Abstract

The service-oriented and data-centric paradigm has been quite prevailing in enterprise applications development, integration, and deployment. Along with its dissemination, a potential – inevitable but must-be-overcome – problem is lack of interoperability among applications as well as poor integrity and quality of individual ones. There is an urgent need for a systematic approach to assuring their integrity and interoperability before deployed. As part of such an approach, we position a validity model that helps us check the seamless connectivity between services to be composed at design time. The validity model represents services' interdependency (e.g., invocation precedence) in a Petri net and each service's semantic description (e.g., functionality and role, input/output data definition, QoS metrics and values) in the web ontology language (OWL). The model can be further used as a service composition model and an input to quality assessment, either as is or with augmentation.